WHAT IS CLAIMED IS:

1. A mesh structure disposed between a plurality of anode units and cathode units of a tetraode field emission display, comprising:

a first conductive layer to serve as a converging electrode layer having a proximal surface facing the anode units and a distal surface opposing to the proximal surface, the first conductive plate comprising a plurality of first apertures extending therethrough;

a glass plate formed on the distal surface of the first conductive layer to serve as an insulation layer, the glass plate including a plurality of second apertures extending therethrough; and

a second conductive layer formed on the glass plate to serve as a gate electrode layer, the second conductive layer having a proximal surface facing the cathode units and a distal surface opposing to the proximal surface, wherein the second conductive layer includes a plurality of third apertures extending therethrough and aligned with the first and second apertures.

2. The mesh structure of Claim 1, wherein each second aperture is aligned with one corresponding first aperture.

3. The mesh structure of Claim 1, wherein each second aperture covers an opening range of a plurality of the first apertures.

4. The mesh structure of Claim 1, wherein each third aperture is aligned with one corresponding first aperture.

5. The mesh structure of Claim 1, wherein each third aperture covers an opening range of a plurality of the first apertures.

6. A mesh structure of a tetra-polar field-emission display, comprising:

a converging electrode layer having an array of first apertures extending therethrough;

an insulation layer having one side adjacent to the converging electrode layer, the insulation layer having a plurality of second apertures aligned with the first apertures; and

a gate layer including a plurality of conductive lines formed on the insulation layer at one side opposite to the side adjacent to the converging electrode layer, wherein each of the conductive lines is aligned with a portion of the converging electrode layer between one pair of neighboring rows of the first apertures.

7. The mesh structure of Claim 6, wherein the gate layer further comprises a hollow frame within which the conductive lines extend.

8. The mesh structure of Claim 6, wherein each of the second apertures is aligned with one corresponding first aperture.

9. The mesh structure of Claim 6, wherein each of the second apertures is aligned with a plurality of corresponding first apertures.

10. A method of fabricating a mesh structure mounted between an anode plate and a cathode plate of a tetra-polar field-emission display, comprising:

providing a first conductive plate;

forming a plurality of first apertures extending through the first conductive plate;

providing a glass plate;

forming a plurality of second apertures extending through the glass plate;

temporally attaching one side of the glass plate to the first conductive plate with the second apertures aligned with the first apertures;

providing a second conductive plate;

forming a plurality of third apertures extending through the second conductive plate;

temporally attaching the second conductive plate to the glass plate with the third apertures aligned with the first and second apertures; and

permanently stacking the first conductive plate, the glass plate and the second conductive plate to form the mesh structure.

11. The method of Claim 10, wherein the step of temporally attaching the glass plate to the first conductive plate includes applying an ultra-violet glue therebetween.

12. The method of Claim 10, wherein the step of temporally attaching the second conductive plate to the glass plate includes applying an ultra-violet glue therebetween.

13. The method of Claim 10, wherein the step of permanently stacking the first and second conductive layers and the glass plate includes a high-temperature sintering process.

14. The method of Claim 10, further comprising selecting the first and second conductive layer fabricated from a material having a thermal expansion coefficient similar to that of the anode plate and the cathode plate.

15. The method of Claim 10, further comprising selecting the glass plate having a thermal expansion coefficient similar to that of the anode plate and the cathode plate.